

DIRECTOR OF CENTRAL INTELLIGENCE
Technology Transfer Intelligence CommitteeExecutive Registry
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29 March 1982NOTE FOR: Admiral B. R. Inman
Deputy Director for Central Intelligence

SUBJECT: NAS Study

1. Under Secretary of Defense DeLauer recently provided you with information about a proposed National Academy of Science study on "National Security Regulations of Technology Transfer and Scientific and Technological Activities of Universities and Professional Societies." We are aware of the study and have been in touch with the NAS staff involved.

2. As you know, the Intelligence Community supports State, Commerce, and other policy agencies by providing intelligence information, analysis and opinions regarding the technology transfer and other implications of proposed visits by Soviets, Eastern Europeans, Chinese, Vietnamese, and Libyans. Sometimes these opinions lead to the "constraints" on foreign communist students that are part of the concern in academe regarding "national security regulations" affecting academic freedom. COMEX, one of the TTIC Subcommittees, is the interagency mechanism that deals with these matters.

3. We have been aware of the proposed NAS study for some time. In fact, Dave Hartmann, the TTIC Executive Secretary, attended an NAS-sponsored meeting last November to discuss the issues and draft terms of reference for the study. More recently, Dave has been in touch with DeLauer's people and with Phil Smith, the NAS Executive Officer. On 23 March, Larry McCray, the NAS staff person assigned to the study panel traveled to Rosslyn to talk with the TTIC Secretariat about the study and Intelligence Community support. At my direction, Dave has assured Smith and McCray that TTIC is ready and willing to be of assistance.

4. We will keep you advised. The NAS Panel will be holding three 1 1/2 day information gathering sessions in April, May, and June. They undoubtedly will ask for Community briefings and discussions, though security clearances are still a problem. At this point, they are thinking of asking you to participate in a dinner meeting and dialogue.

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5. Attached for your information are the latest draft terms of reference, a list of proposed panel members, and an article about Dale R. Corson, the panel chairman.

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Chairman

Attachments:

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STUDY BY
THE COMMITTEE ON SCIENTIFIC
COMMUNICATION AND NATIONAL SECURITY

In recent years, the Soviet Union has made notable strides in competing with the United States in the military sphere -- strides that some fear were made possible in large measure by the harvesting of American technology. As a result, there is increased interest in preventing the transfer of militarily sensitive products and knowledge to our nation's adversaries. One aspect of this effort poses a dilemma for both the government and the research community.

On the one hand, knowledgeable government officials believe that the free availability to foreign nationals of certain unclassified research results in specific fields poses a threat to the national security. Indeed, they have evidence that the Soviet military posture has been notably strengthened by access to such information in the past. Accordingly, they believe it is essential to limit such foreign access through control of the export of scientific information.^{1/} Government officials have expressed concern in particular about foreign access to computer science and mathematics research that bears on cryptology, and to research involving magnetic-bubble memory devices, laser-optics and inertial-confinement fusion, and very high speed integrated circuitry (VHSIC).

On the other hand, most scientists and engineers in academia and elsewhere hold that open communication is an essential element of a creative environment. In their view,

^{1/} Such control could be achieved directly either by expanding the coverage of the military and intelligence classification system, through, for example, revision of the executive order covering such matters, or by the more rigorous application of the system of export controls, which operate independently of the classification system. The chief examples of the latter controls include the International Traffic in Arms Regulations (ITAR), administered by the Department of State, and the Export Administration Regulations (EAR), administered by the Department of Commerce. They currently encompass not only hardware, but also technical data.

Indirect control of the flow of information could be achieved by visa and travel restrictions, or by redirecting United States participation in scientific exchanges and international meetings.

restrictions on communication would sap the strength and vitality of the educational and scientific endeavors upon which our technologies and our national defense are based. Moreover, such restrictions are seen as inconsistent with a free society.

A balanced and objective assessment of these opposing views is both necessary and timely. The interdependence of government and the research community in advancing science, technology and national security requires the prevention of a serious breakdown of mutual confidence.

The review will involve the following elements:

- o An examination of the national-security interests and the interests in free communication in two or three specific fields of science and technology (e.g., cryptology, very high speed integrated circuits, artificial intelligence) to be selected by the study panel in consultation with the Department of Defense. This analysis will include an examination of the extent to which American research has been used in Soviet military programs and, if possible, a consideration of how such information was transferred. In addition, the panel will assess and compare the contribution to Soviet military strength from the transfer of research information with that arising from other means of technology transfer, such as the Soviet acquisition of American hardware.

- o A review (with an emphasis on ITAR, EAR, and a proposed executive order on the classification system) of the principal policy and operational concerns of the respective government agencies, universities, scientific societies, and researchers. (The proprietary concerns of industry will not be considered.) The goal is to identify issues where common agreement exists, to expose those where apparent disagreements are based on misperceptions and misunderstandings, and, perhaps, to narrow and sharpen the issues on which genuine differences exist.

- o A rigorous evaluation of critical issues concerning the application of controls on the flow of research information.^{2/}

^{2/} Such issues might include:

- (i) What do we know about the innovation and technology transfer process that bears on export control policies?; What is the appropriate balance between policies to stimulate and policies to protect critical technological advances?

(footnote con't)

o The development of recommendations and conclusions concerning: (i) the intended and proper reach of controls vis-a-vis various categories of science and technology; (ii) areas of science and technology that are or should be outside the operation of controls; (iii) approaches that might provide more certainty and predictability to the regulatory system; and (iv) alternative procedures that might prove acceptable to all of the concerned sectors.

The study panel for the assessment includes individuals deeply conversant with the goals of science, the nature of universities, and national security concerns. They have expertise in a variety of scientific and engineering disciplines, the management research and development, trade regulation and control, and constitutional law. Liaison members representing the respective government agencies and scientific institutions will be asked to assist the panel in its deliberations and in devising effective means for communicating its final conclusions and recommendations.

The overall effort will be 12 months in duration. The final product will be a public, unclassified report of the panel's findings and recommendations. A progress report will be prepared in September 1982.

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(ii) What are the practical problems with and alternatives to requiring universities to enforce compliance by its students, faculty and visitors? Are the essential qualities of a university compromised by certain forms of regulation?

(iii) How can scientific and engineering advice contribute to the development and enforcement of more effective control regulations?

(iv) What controls on information transfer is it realistically possible to achieve in light of the number and diversity of scientists and engineers in the academe?

PROPOSED COMMITTEE MEMBERSHIP

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rights to extend mutual solidarity in the face of legal attacks, and to extend career security for staff in the face of... unemployment and transfer of production."

Roger Lyons, national officer of the Association of Scientific, Technical & Management Staffs, headquartered in London, said, "This first-ever white-collar action conference resulted from an ASTMS initiative at the International Chemical & Energy Unions Federation Congress in Mexico in 1980. The endorsement in Geneva of strategies proposed by ASTMS and other unions of recruitment techniques... and

coordination within specific multinationals will help extend the unparalleled recruitment success in the U.K. into an unprecedented worldwide crusade within the oil and chemical multinational companies."

ASTMS says that the program that was agreed to in Geneva will now be implemented at the level of the individual multinational companies within the framework of the ICEF worldwide company councils. There soon will be meetings of the councils for Ciba-Geigy, Procter & Gamble, and BASF. The meeting for British Petroleum is being organized, according to ASTMS. □

NAS panel to consider national security issues

The National Academy of Sciences plans to play the role of an "honest broker" in an issue that is polarizing university researchers and national security-minded government officials. The contentious issue is national security controls on technology transfer and, particularly, how these controls affect unclassified scientific and engineering research at universities.

NAS is forming a panel under its Committee on Science, Engineering & Public Policy which will review the government's contention that dissemination of research results in such fields as laser optics and very-high-speed integrated circuitry to Eastern bloc nations could harm national security. The panel also will consider academicians' view that free and open communication feeds the educational and scientific endeavors that support the U.S.'s technological vitality.

At the end of a year, the panel will offer its assessment of the issue. Its ultimate goal is to define the proper balance between government policies that stimulate and those that protect critical technologies.

Funding for the study, which will cost \$200,000 to \$300,000, has not been secured, although the academy is soliciting contributions from professional societies and government agencies. According to NAS president Frank Press, funding will not be a controlling factor. "We are going to do it," Press says, even if the academy has to tap its endowment fund. As if to reinforce that commitment, a panel chairman, Dale R. Corson, professor and president emeritus of Cornell University, has been named, though other panel members and a staff director have not yet been selected.

Corson comes to the chairmanship with wide experience in academia and government. He was a professor of physics and president of Cornell University. During World War II, he was a technical expert in the Air Force where he worked on airborne radar projects. He has served on a number of committees and study groups, including a stint on the Defense Science Board.

As befits a chairman of an embryo panel, Corson refuses to take a stance now. "I want to know what the issues are, what the regulations are, what the problems are" and, then through deliberations, reach "solutions that are in the best interests of this country," he says. In the end, he hopes the panel "can lay out the options and make recommendations that the government and the academic community will accept."



Corson: what are the issues

But it will be a year before the panel's final report is out. In the interval, Press has assured C&EN that he "will speak out in advance of the committee's report" on issues "of great significance." One such issue could be a proposed executive order on safeguarding national security information. "If that executive order wants to place a new classification category on scientific research—not because it is directly related to military systems, but because a relative advantage we might have might be dissipated unless it were restricted—I would argue very strongly against that," Press says.

In a related matter, NAS has adopted new measures in its management of U.S.-U.S.S.R. scientific exchanges. In the future, staff officers will review government restrictions placed on individual visits to determine whether they "are workable and compatible with the general procedures for conducting unclassified research in an academic community." Such reviews will be conducted before NAS communicates the restrictions to host institutions. Also, the academy will attempt to modify strictures that are incompatible with the conduct of university research or are difficult to implement. □

Test developed for explosive sensitivity

Researchers at Los Alamos National Laboratory have developed a technique to measure the sensitivity of an explosive—essentially, how easily it goes off. The method uses a differential scanning calorimeter and deuterium-labeled explosives to determine the sign of the volume of activation of the initial reactions in the explosive process.

LANL researchers Raymond N. Rogers and Joan L. Janney work with triaminotrinitrobenzene (TATB) and take advantage of the kinetic isotope effect. Rogers explains that when hydrogen is replaced with deuterium in a molecule at the site where the rate-determining step occurs—which in the case of explosives is the first step—the rate of the reaction slows.

Also, it has been known for some time, Roger says, that the volume of the molecular orbital of an activated molecule or complex can be larger or smaller than the ground state; in other words, there is a volume of activation. Pressure, therefore, can